

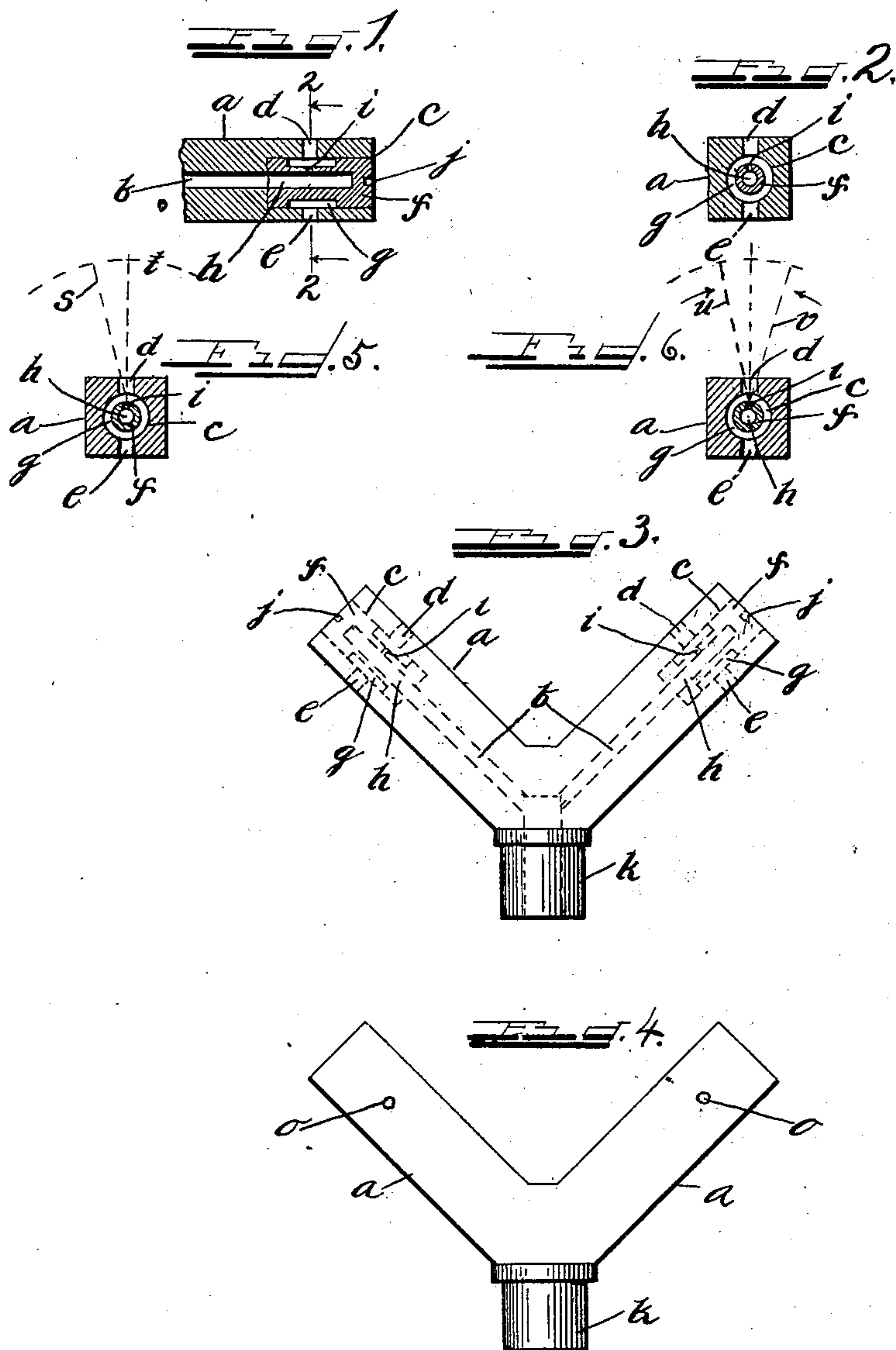
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PATENTED MAY 26, 1903.

J. B. CARROLL.
ACETYLENE GAS BURNER.

APPLICATION FILED NOV. 18, 1901. RENEWED OCT. 27, 1902.

NO MODEL.



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JOHN B. CARROLL, OF CHICAGO, ILLINOIS.

ACETYLENE-GAS BURNER.

SPECIFICATION forming part of Letters Patent No. 728,862, dated May 26, 1903.

Application filed November 18, 1901. Renewed October 27, 1902. Serial No. 129,052. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. CARROLL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Acetylene-Gas Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which similar letters of reference in the different figures indicate corresponding parts.

It is well known that in the manufacture of acetylene-gas burners it is essential, in view of the extremely rich character of the gas, its chemical characteristics, and the pressure at which it is burned, to provide a minute discharge-opening, issuing into a larger one, to which air is admitted below the level of ignition. This permits a very slender thread of gas to issue from the primary opening, which does not burn until it escapes from the exterior one, and in order to maintain the proper contour of flame, as well as to prevent clogging of the burner, it is highly important, if not strictly essential, that the minute jet should be coaxial with that of the final discharge-opening. Moreover, it has been found even more difficult where it is desirable to produce a flat flame by the impingement of two converging flame-jets to insure that high degree of structural accuracy necessary to accomplish the most satisfactory and economical results. It is not practical under the ordinary methods of construction, except at an excessive cost, and especially if the burner be made of a refractory material, to obtain such accuracy of detail in these respects as will conform to commercial demands.

The object of my invention is to overcome these difficulties; and to this end my invention consists in the combination of elements hereinafter more particularly described, and definitely pointed out in the claim.

In the drawings, Figure 1 is a central longitudinal vertical sectional view of a burner embodying the features of my invention. Fig. 2 is a transverse vertical sectional view thereof, taken upon the line 2 2, Fig. 1. Fig. 3 is a side view of a duplex burner having diverging branches, and Fig. 4 is a side view of a

modified form of duplex burner. Figs. 5 and 6 are enlarged diagrammatic views representing a section of the burner as it would appear if taken upon the lines 2 2, Fig. 1, the dotted lines representing the relative directions of the gas-jets when in or out of proper alinement.

Referring to the drawings, *a* represents the body of my improved burner, which consists of a single piece, preferably of refractory material—such, for example, as talc or soapstone—into which is formed a longitudinal bore or supply-conduit *b*. Said bore is made, preferably, upon the line of the axis of the part *a*. Extending inwardly from the outer end of the part *a* is an enlarged bore *c*, which communicates with a final discharge-bore *d*. Communicating with the bore *c*, preferably at the bottom, is a bore *e*, forming an air-supply opening, as hereinafter described. Within the bore *c* is inserted a plug *f*, which while circular in cross-section may or may not be in the form of a cylinder. In the examples shown in Figs. 1 to 3, inclusive, it is represented as being of cylindrical form cut away at the middle, as shown at *g*, said cut-away portion being opposite the openings *d e* and forming an annular chamber around said plug in communication with said openings. The plug *f* is provided with a bore *h*, extending from its inner to near its outer end, said bore being in communication with the supply-conduit *b*. A minute radial opening *i* is formed in the plug *f* and so disposed that when the plug is inserted to its full depth in the bore *c* the opening *i* will be in the plane of the axis of the final discharge-bore *d*. A slot *j* is formed in the outer end of the plug, into which a screw-driver may be inserted to turn said plug upon its axis.

The plug may be secured in position within the bore *c* by means of any suitable cement adapted to withstand the action of heat—such, for example, as La Page's glue or other well-known cement of like character.

While the burner shown in Fig. 1 is complete within itself and is adapted to various uses, it is obvious that two such burners may be connected with a common trunk to form the well-known type of duplex burner shown

in Fig. 3, which consists of a main trunk *k*, having the diverging branches set at such an angle with respect to each other as to enable the flames from the bore *d* to impinge upon each other to form the usual flat flame.

The burner shown in Fig. 4 is precisely like that represented in Fig. 3, except that air-openings are provided at the sides instead of at the bottom.

My improved burner may be made by hand or machinery, and in case the latter is employed it is invariably supplemented by hand adjustment, so that it becomes essential to apply the usual burning or flame test as a part of the operation of completing the burner rather than as the usual final act of inspection after its completion.

The method of constructing my improved burner is as follows: The part *a*, assuming the single form of burner to be under construction, is first made by hand or automatic means to the desired size from a single piece, the bores *b*, *c*, and *d* formed therein, the plug *f* being made of a size and shape to fit loosely within the bore *c*. The bores *h* and *i* are then formed in the plug, the latter being positioned as above described. A quick-setting cement is then applied to the plug. The latter is placed in the bore *c*, when the burner is connected in any well-known way with an acetylene-gas supply and the gas issuing from the discharge *d* lighted. The minute opening *i* while in the plane of the axis of the final-discharge opening is almost sure to be out of alinement therewith in at least one particular, thus impairing the shape of the flame. Assuming the distortion to be indicated by the dotted line *s*, Fig. 5, a screw-driver is inserted in the slot *j* of the plug and the latter rotated until the proper position is secured, as indicated by the line *t*. As soon as this position is attained, the flame will become symmetrical, thereby indicating to the operator that the burner is perfect. The hardening of the cement fixes the plug in position. The duplex burner may be tested in like manner. Assuming the plugs to be so placed that the axes of the respective openings would be represented by the lines *uv*, Fig. 6, screw-drivers may be simultaneously applied to the respective plugs to turn them toward each other, as indicated by the arrows. As soon as perfect alinement is attained it will be indicated by the perfect symmetry of the flame, when the gas may be turned off and the cement left

to harden. In no case is a further test required.

In making the burners from a refractory material they are first formed complete in all their details from the material in its natural state. The parts are then hardened in the usual way, after which they are assembled in the manner set forth. It usually requires about ten minutes for the cement by which the plug is secured in place to harden, when the burner is ready for commercial use.

Inasmuch as the symmetrical shape of the flame is the test of perfect adjustment of the parts in assembling it is obvious that the work may be done very rapidly and with the exercise of but slight skill and experience. In view of the fact that in the use of refractory material the separate parts are formed complete and hardened before being assembled, it follows that there can be practically no defective burners in the finished product.

I am aware of Patent No. 644,799, issued to William Hahn March 6, 1900, and make no claim to the construction therein shown and described.

What I claim, and desire to secure by Letters Patent, is—

An acetylene-burner in which is combined a main body having a longitudinal supply-conduit therein, a final discharge-bore in said main body communicating with and arranged at an angle to the bore forming said supply-conduit, a hollow plug circular in cross-section closed at its outer end, said plug being inserted within the bore forming said supply-conduit, a portion of said plug being cut away opposite said discharge-bore to lessen its diameter, whereby an annular space is formed around said cut-away portion a minute eduction-opening through the wall of said plug, the axis of which coincides with that of said discharge-opening, said minute opening being located in the reduced portion of said plug, and a bore through the wall of said main body to form an air-opening leading to the space surrounding the reduced portion of said plug.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 16th day of November, 1901.

JOHN B. CARROLL.

Witnesses:

D. H. FLETCHER,
ROBERT CATHERWOOD.